

The four species of *Cymphora* fall into two rather well-defined morphological groups that presumably reflect closeness of relationship. *Cymphora venezuelensis* and *C. hintonii* Turner & Powell have ovate to trullate leaves with coarsely serrate margins, petioles 2–5 cm long, phyllaries with 15–20 veins, and, in *C. venezuelensis*, pales with 8–16 veins but pales absent in *C. hintonii*. In contrast, *C. accedens* and *C. pringlei* B. L. Robins. have ovate to ovate-lanceolate leaves with sub-entire to serrate margins, petioles to 2 cm long, phyllaries with 4–9 veins, and pales with 3–5 veins. Nomenclatural recognition of these species groups seems unnecessary in such a small genus until warranted by additional knowledge of the biology of the species.

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#### REVIEW

*California Mushrooms, a Field Guide to the Boletes*. By HARRY D. THIERS. vii + 261, 4 figs., colored microfiche with 54 figs. Hafner Press, New York. 1975. \$15.95.

Californians interested in the boletes now have a treatise prepared by an internationally recognized student of this taxonomically difficult group. Previous comprehensive treatments of this group in North America have emphasized eastern species. Various popular mushroom books have included a few bolete species, but the identification of all but the most common and unique California bolete species was essentially impossible, except for the specialists. It is perhaps a bit optimistic to expect that everyone, even with the aid of Professor Thiers' book, will be able to identify bolete species without a good compound microscope and a good deal of effort and experience. Nevertheless, this book provides a means, regardless of previous training, for anyone to learn the California bolete flora.

Recent taxonomic studies, including this work, in the Boletaceae and of other groups of fungi strongly suggest that there is a greater diversity of fungal species than previously thought. Thus, regional taxonomic treatments rather than worldwide, or even continental, monographs will probably become the objective of the fungal taxonomist, especially those working with the taxa of the saprobic basidiomycetes. Professor Thiers' publication on the Boletaceae of California places this group among the few fungal taxa that are *relatively* well known in any region in North America. Even so, as the author emphasizes, this publication probably represents only a firm starting point for an understanding of the bolete species in California.

The author has wisely based his species descriptions on those specimens housed

in his herbarium. The vast majority of these specimens were collected by the author or his students.

In the introduction (19 pp.) Professor Thiers briefly describes the somatic, or vegetative, phase of the boletes and discusses in more detail the bolete fruiting structures, especially those features of the basidiocarp that are of taxonomic importance. He introduces the necessary terminology in such a manner that a serious student will be able to use the book. Four figures are provided to supplement the explanations given in the text. Techniques of study of the basidiocarps and methods of collecting boletes are subjects that are also covered. The author describes the probably mycorrhizal association of 36 species in table form. This emphasizes the necessity of noting the trees associated with the various bolete species when making collections and of the probable importance of the Boletaceae as mycorrhizal formers with forest trees. In California all bolete species occur only in forested habitats; therefore, they are probably all mycorrhizal formers.

Professor Thiers also provides a brief history of bolete taxonomy and points out the unique features of the species of boletes in California; i.e., the relatively high percentage of endemic species and the absence of representative species of the genera *Strobilomyces* and *Boletellus*.

After a synopsis of the species and subspecies of Boletaceae known from California, a formal description of the family is provided followed by a key to the genera (7) represented in California. Each genus description is followed by a key to the species within each section.

Each species description lists the accepted name of the species as well as several other synonyms and a list of illustrations to the species in other publications. Fifty-four of the eighty California taxa are also illustrated in the colored microfiche. The species or subspecies descriptions consist of a discussion of the macroscopic features of the pileus and stipe, especially the color and texture. The context of both the stipe and pileus are described as are the microscopic features of the tube trama, basidia, and spores. Included here also is the spore print color, still an important taxonomic character in the Agaricales, followed by a description of the reactions of various parts of the basidiocarp to the several chemical tests outlined earlier in the introduction. An appealing feature here, which is often overlooked in other taxonomic treatments of the Agaricales, is that the author cautions the reader that the nature and significance of these chemical tests are essentially unknown.

The author concludes the taxonomic description of the basidiocarps with a discussion of the habitat and distribution of each species in California. He then lists the specimens studied and comments on certain unique features of the species, including its known edibility properties.

The book closes with a field key to the genera, species, and subspecies treated, a list of references, and an index to the various taxa.

This publication is designed for both the professional and amateur mycologist. It is reasonable to expect, in my opinion, that a serious amateur, equipped with a good compound microscope, would be able to identify bolete specimens using this text. While field keys are useful for both the amateur and specialist, mycological taxonomy has long since reached the stage at which microscopic examinations are essential for correct determinations. Among the Agaricales this is probably especially true for the Boletaceae, which are taxonomically notoriously difficult.

There is little doubt but that this publication is an important contribution to the taxonomy of the Agaricales. It will certainly be an essential acquisition for all those interested, for whatever reason, in the mushrooms of California and for all mycological taxonomists. It would, in my opinion, have been desirable to present the 54 color photographs as colored plates rather than in a microfiche; however, this would no doubt have drastically increased the cost, which by today's standards is reasonable. In any case, I, and many others, now eagerly await Professor Thiers' publications on the other families of the Agaricales.—KENNETH WELLS, Department of Botany, University of California, Davis 95616.